REMARKS

Review and reconsideration on the merits are requested.

Claims 1-6 are active; claims 7-12 are withdrawn.

Applicants appreciate the Examiner acknowledging receipt of a certified copy of their priority documents (two priority documents).

Basis for claim amendments.

In claim 1, "for producing a semiconductor or a liquid crystal display" finds basis at page 1, lines 12-15 and page 3, lines 12-22. "Silica and" is included for completeness.

With respect to the limitation added to the end of the claim, see the Examples where resistance to plasma for A was definitely larger than that of control silica glass. For instance, note page 29 just after the first full paragraph.

The remaining amendments are made for consistency.

With respect to "essentially of", incorporation of elements other than the additive elements recited in the Markush group in claim 1 is not preferred, as disclosed at page 7, lines 17-24 of the specification.

Applicants now address the rejections on the merits.

With respect to the rejection of claim 1 under 35 U.S.C. § 112, second paragraph, "highly durable plasma resistant" is canceled from the claims.

Withdrawal is requested.

The prior art: U.S. 5,631,522 Scott (Scott); U.S. 5,532,195 Weiss et al (Weiss); U.S. 6,429,577 Kiryu et al (Kiryu).

Rejection of claims 1, 2 and 6 as anticipated by Scott.

Scott discloses a silica glass comprising fused quartz or synthetic silica doped with cesium, aluminum and yttrium, aluminum and cesium, or aluminum and a yttrium/cesium mixture (col. 4, lines 3-8). The silica glass composition is suitable for applications in which sodium diffusion or electrical resistivity is a problem, for example, in the manufacture of lamp envelopes, semiconductor tubing or semiconductor crucibles (col. 1, lines 4-16; col. 3, lines 41-45).

The silica glass member of the present invention is neither described nor suggested in Scott. First, the silica glass member of the present invention is "for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof". Scott does not suggest a silica glass member having this application. Second, the composition of the silica glass member of the present invention is distinguished from the silica glass composition of Scott.

First Difference: Scott's composition has characteristics such that the diffusion of sodium ions in a lamp envelope through a wall of the glass composition is minimized, i.e., sodium ion migration paths in a wall made of the glass composition are blocked (col. 4, lines 9-19). Thus, Scott teaches applications of the Scott glass composition in which sodium diffusion is a problem, for example, the manufacture of lamp envelopes, semiconductor tubing or semiconductor crucibles (col. 3, lines 41-45).

In contrast, the silica glass member of the present invention is characterized in that etching thereof occurring when it is exposed to a halogen-containing compound gas or a plasma thereof is minimized. The silica glass member of the present invention is thus "for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof". Scott suggests nothing about a silica glass member of the present invention having this specific application.

Second Difference: The silica glass composition of Scott is a glass comprising fused quartz or synthetic silica doped with cesium, aluminum and yttrium, aluminum and cesium, or aluminum and a yttrium/cesium mixture (col. 4, lines 3-8). More specifically, fused quartz or synthetic silica doped with (i) at least about 20 ppm by weight cesium and optionally with aluminum, (ii) at least about 10 ppm by weight aluminum in combination with 0 to about 1000 ppm by weight yttrium and 0 to about 1000 ppm by weight cesium, provided that at least one of yttrium and cesium is present (col. 4, lines 48-53). In the case when the silica glass composition of Scott contains yttrium, the silica glass combination further comprises cesium and/or aluminum in combination with yttrium. In the examples of Scott, silica glass compositions containing yttrium and aluminum are disclosed (col. 5, Table 1), but silica glass compositions containing **only** yttrium dopant are not disclosed.

In contrast, the silica glass member of the present invention consists essentially of silica and 0.01% to 2% by weight of at least one element ("additive element") selected from magnesium, calcium, strontium, barium, yttrium, hafnium and zirconium. In other words, the

silica glass member of the present invention comprises silica and a specific limited amount of additive element, but is substantially free from other elements.

Scott teaches nothing about "a composition" constituting the silica glass member of the present application, nor about a member for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof.

Applicants thus respectfully submit that the present invention is neither anticipated by nor obvious from Scott.

Withdrawal is requested.

Rejection of claims 1 and 2 as anticipated by Weiss.

Weiss discloses a quartz glass doped with stoichiometric compounds of alkaline earth oxides and boron oxide, where the doping substance is used in an amount of from 0.05 to 0.8% by weight. The quartz glass is used as a bulb of an incandescent lamp or as an envelope in an arc vessel of a discharge lamp (Abstract, col.. 1, lines 22-25).

The silica glass member of the present invention is not disclosed in Weiss. The silica glass member of the present invention is clearly distinguished from the lamp bulb or the lamp envelope of Weiss et al.

First, Weiss does not disclose silica glass consisting essentially of silica and 0.01% to 2% by weight of the additive element as used in the present invention (namely, the silica glass used in the present invention is substantially free from boron oxide).

Secondly, a member for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof is distinguished from a bulb of an incandescent lamp or as an envelope in an arc vessel of discharge lamp.

Applicants thus respectfully submit that the silica glass member of the present invention is no fashion anticipated by Weiss and request withdrawal of the rejection.

Rejection of claims 1-5 as anticipated by Kiryu.

Kiryu discloses a discharge lamp comprising an arc tube containing a pair of electrodes in a light-emitting portion and an outer tube that envelopes the light-emitting portion and is at least partly fused to the arc tube (Abstract, lines 1-4). The Kiryu discharge lamp is complexly different from the silica glass member of the present invention for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof.

The Kiryu outer tube is a silica glass comprising 90-99.88% by weight of silica and 0.12% or more, preferably 0.04-2.0% by weight, of boron (Abstract, col. 5, lines 25-26). Further, the Kiryu silica glass comprises aluminum, preferably in an amount of 0.02-1.0% by weight (col. 5, lines 28-30). Both boron and aluminum are substantially excluded from the silica glass constituting the silica glass member of the present invention.

Thus, the silica glass member of the present invention is clearly distinguished from the discharge lamp of Kiryu.

First, Kiryu does not disclose silica glass consisting essentially of silica and 0.01% to 2% by weight of an additive element as used in the present invention (namely, the silica glass used in the present invention is substantially free from boron and aluminum).

Second, a member for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof is clearly distinguishable from the discharge lamp of Kiryu. The silica glass member of the present invention would not be anticipated by Kiryu.

The unobvious of the present invention over Weiss and Kiryu.

Applicants submit that the silica glass member of the present invention would not be rendered obvious by Weiss or Kiryu for the following reasons. In both Weiss and Kiryu , it is essential that the silica glass contain boron.

Specifically, in Weiss, alkaline earth oxides and boron oxide are used in combination in the quartz glass for reducing the viscosity of the quartz glass, and the boron oxide tends to counteract the increased tendency for crystallization of quartz glass caused by the alkaline earth oxides (col. 2, lines 9-15).

In Kiryu, by the incorporation of boron, the softening temperature of the outer tube can be made lower than that of the arc tube, and, consequently, when the arc tube and the outer tube fused, deformation of the arc tube can be prevented (Kiryu et al, col. 1, lines 47-53).

In contrast, the incorporation of boron oxide should be avoided for a member for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof per the present invention.

Silicon has no electrical conductivity. Thus, it is essential that a minor and precisely controlled amount of electrical conductivity-imparting substance such as boron or phosphorus be incorporated in silicon as a dopant to prepare a silicon semiconductor. However, the electro-conductivity of a silicon semiconductor greatly varies depending upon the amount of boron incorporated. Therefore, the amount of boron used as a dopant must be precisely controlled, and contamination of silicon occurring in the course of producing a semiconductor device must be prevented to avoid undesirable changes in the concentration of boron in the semiconductor device.

The above facts are well known to a person skilled in the art. To show this, Applicants submit partial translations of the following two Japanese documents.

Document 1: Hiroyuki Matsunami "Semiconductor Technology", first edition, 6th print, published April 15, 1986 by K.K. Shoko-do, Japan.

Document 2: Katsufusa Shono "100 Collections of Semiconductor Technology on Ultra-large Scale Integrated Circuit [II]", first edition, 3rd print, published July 10, 1983 by K.K. OHM, Japan.

Document 1 teaches that a raw material for a semiconductor is first purified, and thereafter a required amount of impurity is added.

Document 2 teaches that contamination of silicon with boron in the disclosed process is serious and must be avoided.

The silica glass compositions used in Weiss and Kiryu contain boron as an indispensable ingredient. Therefore, such silica glass composition are not suitable for use as a semiconductor

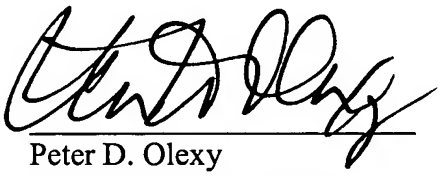
material. Clearly, there is no motivation of using the boron-containing silica glass as disclosed in Weiss and Kiryu for a silica glass member for use in a plasma reaction apparatus for producing a semiconductor or a liquid crystal display using a halogen-containing compound gas and a plasma thereof.

Accordingly, Applicants submit that the present invention is not rendered obvious by Weiss or Kiryu.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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